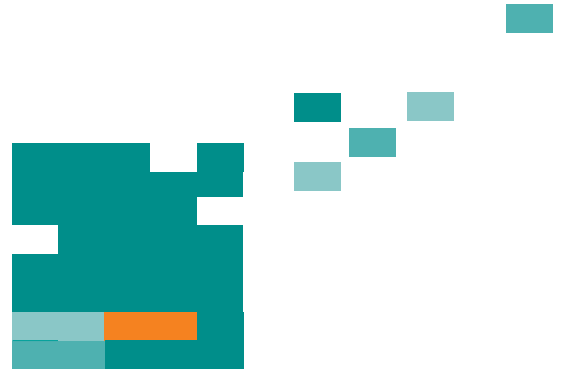


56TH IWK

International Scientific Colloquium
Ilmenau University of Technology



12 – 16 September 2011

Innovation in Mechanical Engineering – Shaping the Future



Faculty of Mechanical Engineering

IMPRESSUM

Editor:

Rector of the Ilmenau University of Technology
Univ.-Prof. Dr. rer. nat. habil. Dr. h. c. Prof. h. c. Peter Scharff

Dean of the Faculty of Mechanical Engineering
Univ.-Prof. Dr.-Ing. habil. Prof. h. c. Peter Kurtz

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PREFACE

Dear Conference Participants

We are delighted to welcome you to Ilmenau University of Technology for the 56th International Scientific Colloquium (Internationales Wissenschaftliches Kolloquium, IWK). The IWK looks back on fifty-six years of tradition in exchanging scientific ideas and bridging disciplines.

In 2011, the International Scientific Colloquium is again organised by the Faculty of Mechanical Engineering. The title of this year's conference:

“Innovation in Mechanical Engineering – Shaping the Future”,

is intended to reflect both the width and the depth of modern Mechanical Engineering. In three main headings many research areas are addressed, all involving innovations in Mechanical Engineering:

- Precision Engineering and Precision Measurement Technology
- Mechatronics and Ambient Assisted Living
- Systems Technology

The Colloquium, complemented by workshops, is characterised by the topics listed above, but not narrowly limited to them.

The main subjects of this year's IWK are those facets of Mechanical Engineering in which our own Faculty strives to excel, as a centre of both research and teaching. They are also part of the dedicated research strategy which Ilmenau University of Technology as a whole has defined as a strategic guideline.

As always in the long series of IWK conferences, we invite and encourage contributions both from academia and industry. No matter whether you are an experienced professional or a novice in mechanical engineering – we are convinced that the 56th International Scientific Colloquium in Ilmenau will be of benefit to you.

The discussions during the IWK will doubtless be both, wide and deep, exciting and exhaustive, providing the material, we are sure, for further publications in the various respective subject-related journals.

We are delighted with the response to the call for papers. After careful international reviewing, 166 contributions remain for presentation, representing 21 countries. The range of subjects certainly reflects the interdisciplinary nature of the conference topics and will bring together industrialists and scientists from a variety of disciplines.

Besides a fruitful and interesting professional exchange of views, we wish you an enjoyable stay in the town of Ilmenau and its surroundings. The town has close connections to Johann Wolfgang von Goethe who already 200 years ago appreciated its beauty and came back many times, both on business and for pleasure. Perhaps the 56th IWK will inspire you to follow in his footsteps!



Univ.-Prof. Dr. rer. nat. habil.
Dr. h. c. Prof. h. c. mult. Peter Scharff
(Professor Peter Scharff)
Rector of the Ilmenau University
of Technology



Univ.-Prof. Dr.-Ing. habil.
Prof. h. c. Peter Kurtz
(Professor Peter Kurtz)
Dean of the Faculty of
Mechanical Engineering

International Scientific Committee

These Papers were evaluated by the by the members of the *International Scientific Committee* in a peer review process.

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Weber, Christian	Ilmenau University of Technology, Germany
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Weiß, Mathias	Ilmenau University of Technology, Germany
Witte, Hartmut	Ilmenau University of Technology, Germany
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Zimmermann, Klaus	Ilmenau University of Technology, Germany

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Topic 1: Precision Engineering and Precision Measurement Technology

Session 1.1 Nanopositioning and Nanomeasuring Technology

A simulation model for an optical-electrical combination conductor system

Lustermann, Birgit; Viehmann, Matthias; Kloss, Christina

URN: [urn:nbn:de:gbv:ilm1-2011iwk-036:9](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-036:9)

High resolution slope measuring deflectometry for the characterization of ultra-precise reflective X-ray optics

Siewert, Frank; Buchheim, Jana; Höft, Tobias; Fiedler, Stefan; Bourenkov, Gleb; Cianci, Michele; Signorato, Riccardo

URN: [urn:nbn:de:gbv:ilm1-2011iwk-136:7](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-136:7)

True 3D measurements of micro and nano structures

Dai, Gaoliang; Bütetfisch, Sebastian; Pohlenz, Frank; Danzebrink, Hans-Ulrich; Flügge, Jens

URN: [urn:nbn:de:gbv:ilm1-2011iwk-105:6](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-105:6)

Design and verification of the TriNano ultra precision CMM

Moers, Ton; van Riel, Martijn; Bos, Edwin

URN: [urn:nbn:de:gbv:ilm1-2011iwk-092:8](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-092:8)

Homodyne interference signal demodulation for nanopositioning and nanomeasuring machines

Hausotte, Tino; Percle, Brandon; Gerhardt, Uwe; Dontsov, Denys; Manske, Eberhard; Jäger, Gerd

URN: [urn:nbn:de:gbv:ilm1-2011iwk-110:5](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-110:5)

Session 1.2 Measurement and Sensor Technology

Spectroscopic determination of the effective humidity for distance measurements in air

Pollinger, Florian; Meiners-Hagen, Karl; Doloca, Nicolae Radu; Abou-Zeid, Ahmed

URN: [urn:nbn:de:gbv:ilm1-2011iwk-094:3](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-094:3)

Avogadro constant determination for a redefined kilogram

Bettin, Horst; Borys, Michael; Busch, Ingo; Nicolaus, Arnold; Becker, Peter

URN: [urn:nbn:de:gbv:ilm1-2011iwk-067:0](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-067:0)

Directional tactile sensor composed of conductive polymer for monolithic compliant mechanism

Chaykina, Alexandra; Griebel, Stefan; Gorbatenko, Nikolay; Zentner, Lena

URN: [urn:nbn:de:gbv:ilm1-2011iwk-101:5](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-101:5)

Calibration of a Lorentz force flowmeter

Gramß, Michael; Karcher, Christian

URN: [urn:nbn:de:gbv:ilm1-2011iwk-054:9](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-054:9)

Transverse sensitivity of three-axial high sensitivity accelerometers

Andrianov, Valery; Mazin, Valery

URN: [urn:nbn:de:gbv:ilm1-2011iwk-027:9](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-027:9)

Procedures for gauging of volumina at fuel stations

Henning, Markus; Almeroth, Tino; Kühn, Olaf; Weinert, Rico; Linß, Gerhard; Birli, Oliver

URN: [urn:nbn:de:gbv:ilm1-2011iwk-109:0](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-109:0)

New definition of the kelvin and determination of the Boltzmann constant

Fischer, Joachim; Zandt, Thorsten

URN: [urn:nbn:de:gbv:ilm1-2011iwk-013:1](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-013:1)

Dynamic weighing calibration method for liquid flowmeters - a new approach

Aguilera, Jesus

URN: [urn:nbn:de:gbv:ilm1-2011iwk-125:1](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-125:1)

The redefinition of the ampere

Ahlers, Franz J. ; Siegner, Uwe

URN: [urn:nbn:de:gbv:ilm1-2011iwk-151:3](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-151:3)

The watt balance route towards a new definition of the kilogram

Eichenberger, Ali; Baumann, Henri; Jeckelmann, Beat

URN: [urn:nbn:de:gbv:ilm1-2011iwk-099:5](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-099:5)

Dynamic characteristics of resonators under the action of varying frequency

Nazarenko, Valery; Mironova, P.; Polubok, Vladislav

URN: [urn:nbn:de:gbv:ilm1-2011iwk-018:9](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-018:9)

Experimental investigation of liquid flows in different pipe configurations using improved LDA techniques

Wendt, Gudrun

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Novel approaches to reduce the uncertainty of torque standard machines for small torques

Wagner, Alexander; Theska, René; Bitencourt, A. C. P.; Lepikson, H. A.;

Weingaertner, Walter Lindolfo

URN: [urn:nbn:de:gbv:ilm1-2011iwk-053:1](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-053:1)

Aero-acoustical sound source tracking of a flowed cylinder with a beamforming code

Maier, Christian; Macdonald, M.; Waidmann, Winfried; Harrison, D.; Pannert, Wolfram

URN: [urn:nbn:de:gbv:ilm1-2011iwk-068:7](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-068:7)

Session 1.3 Precision and Optical Engineering

The dimensional control of object on a position of inflection points of the diffraction pattern

Ivanov, Alexander

URN: [urn:nbn:de:gbv:ilm1-2011iwk-009:2](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-009:2)

Lens mounts in optical high performance systems with small diameters

Sondermann, Mario; Scheibe, Hannes; Theska, René

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Investigations on clearance seal units for moving elements in an ultra-high vacuum region

Heidler, Nils; Mohaupt, Matthias; Risse, Stefan; Döring, Hans-Joachim

URN: [urn:nbn:de:gbv:ilm1-2011iwk-074:4](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-074:4)

3D vibrating probe for measuring microfeatures with nanometer uncertainty

van Riel, Martijn; Bos, Edwin

URN: [urn:nbn:de:gbv:ilm1-2011iwk-139:2](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-139:2)

Measurement of guideway alignment of an on-site grinding machine

Widmaier, Thomas ; Kuosmanen, Petri; Juhanko, Jari

URN: [urn:nbn:de:gbv:ilm1-2011iwk-146:4](http://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-146:4)

The use of deflecting elements in interferometric applications – advantages and challenges

John, Kerstin; Theska, René; Erbe, Torsten

URN: [urn:nbn:de:gbv:ilm1-2011iwk-012:3](http://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-012:3)

Micro radial grating disk manufactured by nanoimprinting technique for transmission error measurement of micro gears

Kurokawa, Syuhei; Hoga, Morihisa; Matsukawa, Yoji; Ohnishi, Osamu; Doi, Toshiro

URN: [urn:nbn:de:gbv:ilm1-2011iwk-095:1](http://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-095:1)

Development of the measurement system for the assembly of rotary axis in a tool grinder

Wang, Yung-Cheng; Chen, Chi-Hsiang; Lee, Bean-Yin; Lin, Jui-Chang; Lin, Wei-Shin; Cheng, Chia-Hao

URN: [urn:nbn:de:gbv:ilm1-2011iwk-048:2](http://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-048:2)

Meshing behaviour of miniaturised plastic gear pairs for power transmission using FEM

Fraulob, Sebastian; Schirmer, Jens; Richter, Stefan; Nagel, Thomas

URN: [urn:nbn:de:gbv:ilm1-2011iwk-149:0](http://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-149:0)

Automated setup for non-tactile high-precision measurements of roundness and cylindricity using two laser interferometers

Kühnel, Michael; Gerhardt, Uwe; Ullmann, Vinzenz; Manske, Eberhard

URN: [urn:nbn:de:gbv:ilm1-2011iwk-089:3](http://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-089:3)

Design of an interferometric test station for parallel inspection of MEMS

Schaeffel, Christoph; Michael, Steffen; Paris, Roman.; Frank, Astrid; Zeike, Norbert; Gastinger, Kay; Kujawinska, M.; Zeitner, U.; Beer, S.

URN: [urn:nbn:de:gbv:ilm1-2011iwk-098:5](http://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-098:5)

The influence of asymmetric flexure hinges on the axis of rotation

Linß, Sebastian; Erbe, Torsten; Theska, René; Zentner, Lena

URN: [urn:nbn:de:gbv:ilm1-2011iwk-006:6](http://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-006:6)

Session 1.5 Image Processing and Quality Assurance

One shot optical 3D surface reconstruction of weak textured objects for an agricultural application

Laurosowski, Martin; Kerstein, Thomas; Klein, Philipp; Weyrich, Michael; Roth, Hubert; Wahrburg, Jürgen

URN: [urn:nbn:de:gbv:ilm1-2011iwk-143:1](http://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-143:1)

Uncertainty estimation of image-based measurements affected by motion blur

Weißensee, Karina; Holder, Silvio; Linß, Gerhard

URN: [urn:nbn:de:gbv:ilm1-2011iwk-085:9](http://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-085:9)

A structured LED multi linear light for groove measurement of a spectacle frame

Kienast, Sascha; Rückwardt, Matthias; Göpfert, André; Schellhorn, Mathias; Rosenberger, Maik; Holder, Silvio; Linß, Gerhard

URN: [urn:nbn:de:gbv:ilm1-2011iwk-002:6](http://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-002:6)

Method for a robust search line based estimation of intensity edge width in blurred gray scale images for quantification of motion- and out-of-focus blur

Holder, Silvio; Xie, Ke; Göpfert, André; Rückwardt, Matthias; Büchner, Marco; Linß, Gerhard

URN: [urn:nbn:de:gbv:ilm1-2011iwk-087:5](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-087:5)

Application of image processing for autonomous robots

Ußfeller, Christoph

URN: [urn:nbn:de:gbv:ilm1-2011iwk-104:8](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-104:8)

Parameter estimation of mixture distributions using evolutionary modeling for evaluation of optomechatronic systems

Lachmayer, Roland; Mozgova, Iryna; Stephan, S.; Kuznetsov, Konstantyn; Biloborodko, Oxana

URN: [urn:nbn:de:gbv:ilm1-2011iwk-141:6](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-141:6)

Use-appropriate design of automated optical inspection systems for rotationally symmetric parts

Laurowski, Martin; Klein, Philipp; Weyrich, Michael; Scharf, Peter; Stark, Sven

URN: [urn:nbn:de:gbv:ilm1-2011iwk-142:3](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-142:3)

Lifetime prediction of smart meter - estimation of lifetime parameters

Almeroth, Tino; Kühn, Olaf; Linß, Gerhard

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Topic 2: Mechatronics and Ambient Assisted Living

Session 2.1 Mechatronic Systems

Direct simulation of mechanical control systems using algorithmic differentiation

Röbenack, Klaus; Winkler, Jan; Knoll, Carsten

URN: [urn:nbn:de:gbv:ilm1-2011iwk-015:6](http://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-015:6)

Odometry for mobile robots with laser sensors

Frank, Sebastian; Schale, Florian; Ußfeller, Christoph

URN: [urn:nbn:de:gbv:ilm1-2011iwk-044:1](http://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-044:1)

Simulation and control of a servo drive with oscillatory mechanics

Neugebauer, Reimund; Quellmalz, Johannes; Walther, Michael; Schlegel, Holger

URN: [urn:nbn:de:gbv:ilm1-2011iwk-066:2](http://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-066:2)

An approach to compliant locomotion systems based on tensegrity structures

Böhm, Valter; Jentzsch, Alexander; Kaufhold, Tobias; Schneider, Florian; Zimmermann, Klaus

URN: [urn:nbn:de:gbv:ilm1-2011iwk-128:4](http://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-128:4)

An underactuated modular robot for testing control algorithms

Zelei, Ambrus; Bencsik, Laszlo; Stepan, Gabor

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Session 2.2 Assistance Systems

Various adaptive control strategies applied to a bio-inspired receptor model

Loepelmann, Peter; Behn, Carsten

URN: [urn:nbn:de:gbv:ilm1-2011iwk-022:1](http://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-022:1)

Trajectory generation experimental results of a single traction ball mobile robot

Pozo Fortunic, Edmundo; Kato Ishizawa, Gustavo

URN: [urn:nbn:de:gbv:ilm1-2011iwk-114:6](http://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-114:6)

Vibration driven robots

Bolotnik, Nikolai; Zeidis, Igor; Zimmermann, Klaus; Yatsun, Sergey

URN: [urn:nbn:de:gbv:ilm1-2011iwk-079:5](http://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-079:5)

Worm-like locomotion systems: development of drives and selective anisotropic friction Structures

Schulke, Matthias; Hartmann, Lars; Behn, Carsten

URN: [urn:nbn:de:gbv:ilm1-2011iwk-023:8](http://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-023:8)

Development and evaluation of stereoscopic situation displays for air traffic control

Wittmann, David; Baier, Andreas; Neujahr, Harald; Petermeier, Benedikt; Sandl, Peter; Vernaleken, Christoph; Vogelmeier, Leonhard

URN: [urn:nbn:de:gbv:ilm1-2011iwk-117:9](http://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-117:9)

Remote rehabilitation assistance with the compliant robot arm BioRob

Schweitzer, Markus; Karguth, Andreas; Trommer, Christian

URN: [urn:nbn:de:gbv:ilm1-2011iwk-016:4](http://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-016:4)

Modeling and dynamical simulation of vibration-driven robots

Becker, Felix; Minchenya, Vladimir; Zeidis, Igor; Zimmermann, Klaus

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Transversal vibrations of beams with boundary damping in the context of animal vibrissae

Schäfer, Micha; Schmitz, Tonia; Will, Christoph; Behn, Carsten

URN: [urn:nbn:de:gbv:ilm1-2011iwk-024:6](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-024:6)

Analytical investigations and adaptive control of vibrissae-like sensor models with finite DoF

Schmitz, Tonia; Behn, Carsten

URN: [urn:nbn:de:gbv:ilm1-2011iwk-021:3](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-021:3)

Modelling of creativity and collaboration methodology for development the Manu future products and processes.

Bargelis, Algirdas; Baltrusaitis, Alfredas

URN: [urn:nbn:de:gbv:ilm1-2011iwk-059:0](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-059:0)

Pneumatically driven compliant structures based on the multi-arc principle for the use in adaptive support devices

Linß, Sebastian; Griebel, Stefan; Kikova, Teodora; Zentner, Lena

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Topic 3: Systems Technology

Session 3.1.1 Material Properties, Manufacturing, Assembly

Changeability training for employees in manual assembly

Schlüter, Meike; Stodtko, Iris

URN: [urn:nbn:de:gbv:ilm1-2011iwk-028:7](http://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-028:7)

Extreme bending of spring steel wire - theory and experiment

Weiss, Mathias; Steigenberger, Joachim; Geinitz, Veronika; Beyer, Peter

URN: [urn:nbn:de:gbv:ilm1-2011iwk-020:5](http://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-020:5)

Advanced manufacturing technologies for automotive structures in multi-material design consisting of high-strength steels and CFRP

Frantz, Meike; Lauter, Christian; Tröster, Thomas

URN: [urn:nbn:de:gbv:ilm1-2011iwk-118:7](http://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-118:7)

Optimised heat treatment in wire and spring manufacture

Lux, Ruediger; Kletzin, Ulf; Beyer, Peter

URN: [urn:nbn:de:gbv:ilm1-2011iwk-070:3](http://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-070:3)

Session 3.1.2 Design Methods and Processes

A function-oriented approach for a mechatronic modularization of a sensor-guided manufacturing system

Weyrich, Michael; Klein, Philipp; Laurowski, Martin; Wang, Yongheng

URN: [urn:nbn:de:gbv:ilm1-2011iwk-122:8](http://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-122:8)

Design and development of a feeding aid device to assist people with deficiency

Seabra, Eurico; Ferreira da Silva, Luís ; Machado, José

URN: [urn:nbn:de:gbv:ilm1-2011iwk-039:5](http://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-039:5)

Design to knowledge - a root design principle

Vielhaber, Michael

URN: [urn:nbn:de:gbv:ilm1-2011iwk-060:6](http://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-060:6)

Supply of measurement results of spring wire tests on the internet

Braunschweig, Marion; Weiss, Mathias; Liebermann, Kersten

URN: [urn:nbn:de:gbv:ilm1-2011iwk-026:2](http://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-026:2)

Design and simplified manufacturing of large-deflective flexure hinges based on polynomial contours

Linß, Sebastian; Erbe, Torsten; Zentner, Lena

URN: [urn:nbn:de:gbv:ilm1-2011iwk-005:9](http://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-005:9)

Results of modeling the mechanical behavior of an ionic polymer-metal-composite for assembling as actuation systems

Huba, Antal; Muka, István; Schrödner, Martin; Schilling, Cornelius; Köhring, Sebastian; Witte, Hartmut

URN: [urn:nbn:de:gbv:ilm1-2011iwk-121:0](http://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-121:0)

Application of a sales-tool for optimized tender preparation in small and medium-sized companies

Nehuis, Frank; Türk, Eiko; Vietor, Thomas

URN: [urn:nbn:de:gbv:ilm1-2011iwk-014:9](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-014:9)

Autogenetic design and optimization using reduced system models

Hehenberger, Peter; Kittel, Konstantin; Zeman, Klaus; Vajna, Sandor

URN: [urn:nbn:de:gbv:ilm1-2011iwk-084:2](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-084:2)

Session 3.1.3 Machine Elements and Systems

Contact pressure and wear in helical compression springs

Gevorgyan, Vahan; Kletzin, Ulf

URN: [urn:nbn:de:gbv:ilm1-2011iwk-072:9](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-072:9)

Development and comparison of high order toroidal finite elements for calculating disc springs

Wehmann, Christoph; Rieg, Frank

URN: [urn:nbn:de:gbv:ilm1-2011iwk-052:3](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-052:3)

Fatigue damage parameter and their use in estimating lifetime of helical compression springs

Reich, Rene; Kletzin, Ulf

URN: [urn:nbn:de:gbv:ilm1-2011iwk-069:8](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-069:8)

Reliability prediction using the Cox proportional hazards model

Bobrowski, Sebastian; Döring, Maik; Jensen, Uwe; Schinköthe, Wolfgang

URN: [urn:nbn:de:gbv:ilm1-2011iwk-017:2](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-017:2)

Large-scale test rig for assessment of characteristics of flat air bearings running against a rotating counter-face

Calonius, Olof; Kiviluoma, Panu; Kuosmanen, Petri

URN: [urn:nbn:de:gbv:ilm1-2011iwk-111:3](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-111:3)

Damage mechanism in the Cermet fuel rod shell undergoing a rapid cooling: analytic modeling

Chigareva, Julia; Minchenya, Vitaly

URN: [urn:nbn:de:gbv:ilm1-2011iwk-082:6](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-082:6)

Relaxation of helical springs and spring steel wires

Geinitz, Veronika; Weiss, Mathias; Kletzin, Ulf; Beyer, Peter

URN: [urn:nbn:de:gbv:ilm1-2011iwk-064:6](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-064:6)

Session 3.2 Sustainable Mobility

Obstacle avoidance for multi-axle steered multi-body vehicles

Beyersdorfer, Susann; Wagner, Sebastian; Zipser, Stephan

URN: [urn:nbn:de:gbv:ilm1-2011iwk-133:3](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-133:3)

Characterization of particulate emissions of vehicle wheel brakes

Horn, Rüdiger; Augsburg, Klaus; Sachse, Hannes

URN: [urn:nbn:de:gbv:ilm1-2011iwk-057:2](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-057:2)

CFD investigation of the injection and combustion process in a diesel engine

Waidmann, Winfried

URN: [urn:nbn:de:gbv:ilm1-2011iwk-029:7](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-029:7)

Workshop: Virtual Engineering throughout the Product Life-Cycle

Auralisation of acoustical product properties for technical systems in virtual environments

Weber, Christian; Husung, Stephan; Brix, Torsten; Brix, Sandra; Sladeczek, Christoph

URN: [urn:nbn:de:gbv:ilm1-2011iwk-032:8](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-032:8)

Numerical RANS simulation of cavitation in throttles - approaches and first results

Fuchs, Martin; Dirke, M. von; Macdonald, M.; Waidmann, Winfried

URN: [urn:nbn:de:gbv:ilm1-2011iwk-077:7](https://nbn-resolving.org/urn:nbn:de:gbv:ilm1-2011iwk-077:7)